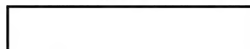




NATIONAL PHOTOGRAPHIC
INTERPRETATION CENTER

**BASIC IMAGERY
INTERPRETATION
REPORT**

**MOSKVA SOLID MOTOR
PRODUCTION PLANT LYUBERTSY**



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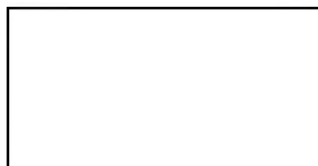
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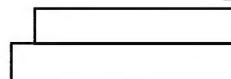
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INSTALLATION OR ACTIVITY NAME

Moskva Solid Motor Production Plant Lyubertsy

COUNTRY

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UTM COORDINATES

NA

GEOGRAPHIC COORDINATES

55-37-00N 037-51-35E

CATEGORY

INSTRUMENT NO.

MAP REFERENCE

ACIC. USATC, Series 200, Sheet M0167-5HL, 3d ed, Jul 67, scale 1:200,000

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LATEST IMAGERY USED

NEGATION DATE (if required)

NA

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ABSTRACT

1. The Moscow Solid Motor Production Plant Lyubertsy consists of five areas: the probable double-base propellant area, the probable composite propellant area, the test area which contains three test cells, the possible nondestruct test area, and the probable waste propellant disposal area.

2. A research and development function is suggested by the diversity of the production and testing facilities present in the plant. The facility was probably operational [] possibly considerably earlier.

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3. Included in this report are a location map, a photograph, and line drawings of the more significant areas of the facility with tabulated mensural data, functional identifications of individual structures, and an update in the chronological development of the facility. The information in this report is current through []

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INTRODUCTION

4. The Moscow Solid Motor Production Plant Lyubertsy is located on the northern bank of the Moscow river, 12 nautical miles (nm) southeast of the center of Moscow (Figure 1). This facility may be the production area and proving ground for solid propellant formulations and rocket motor designs conceived in the engineering buildings of the Lyubertsy Explosives and Propellants Research and Development Facility, 1.6 nm to the west. A small secured storage area, probably functionally related to the solid motor production plant, is 1.2 nm to the northwest.

5. Security at the Lyubertsy site is provided by a wall and a fence surrounding the entire facility. There are two road entrances at the northeastern corner of the facility; each has a guardhouse.

BASIC DESCRIPTION

6. The solid motor plant at Lyubertsy consists of 85 structures situated on approximately 250 acres (Figure 2). It is probably a solid rocket motor research and development facility but may incorporate some production capability. The facility has approximately [] of floorspace and appears to have the capability to produce and test both cast double-base and composite propellant rocket motors. The small size of the production areas for motors of both basic types suggests an R&D effort. Major structures are shown on Figure 3, keyed to Table 1. Nine areas have been delineated on Figure 3 to facilitate discussion of the facility; five of these areas are key areas and are described below.

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7. Eleven structures in the facility are equipped with large gantry cranes, indicating that those structures are involved with the handling of heavy rocket motors and components at various stages of production and testing. The large number and size of the gantry cranes might be explained by the necessity for more handling equipment because of the lack of rail transportation or by the handling problems which might be encountered if rocket motors were being cast into heavy, reusable steel cases. None of the other Soviet

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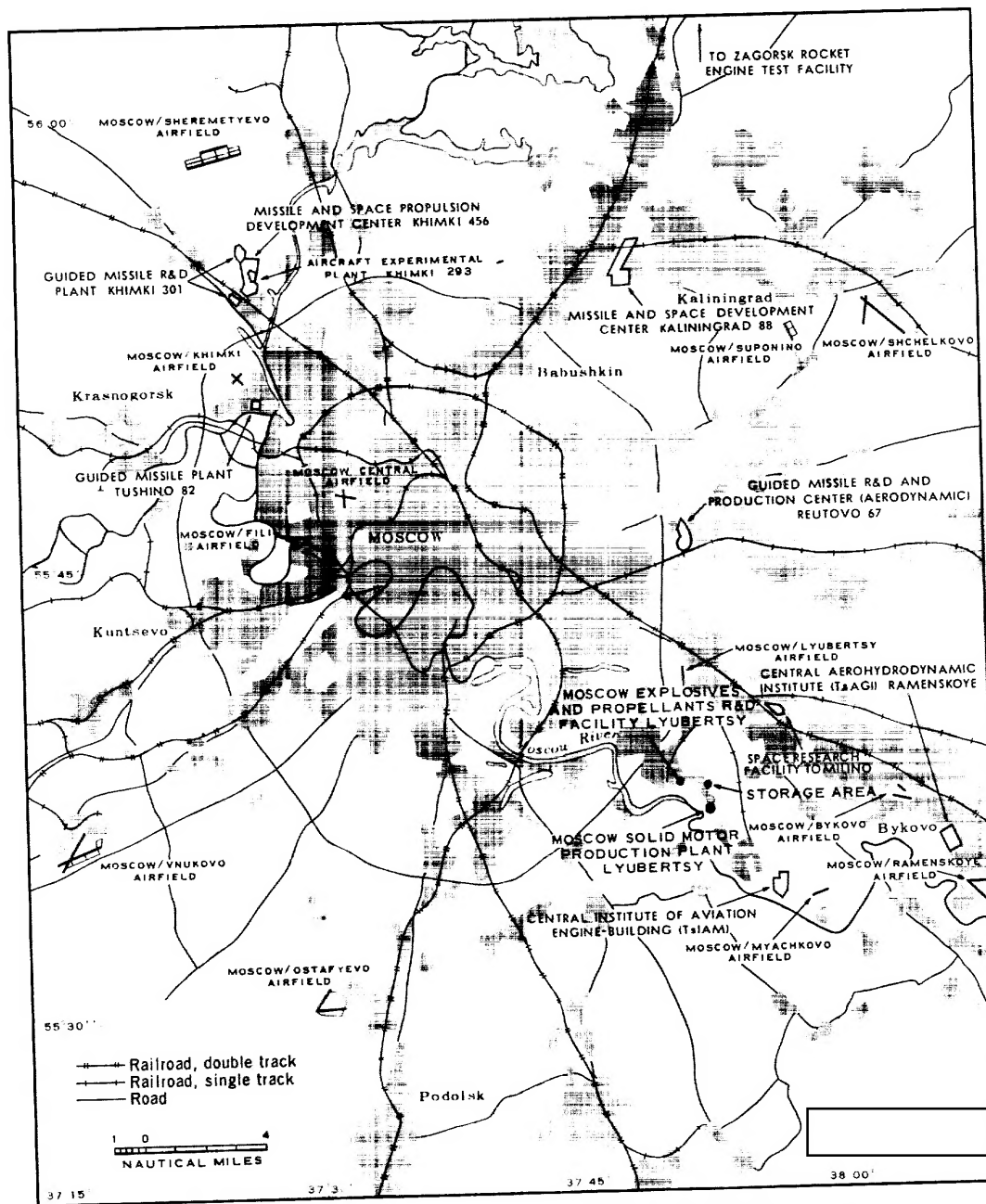


FIGURE 1. LOCATION OF MOSKVA SOLID MOTOR PRODUCTION PLANT LYUBERTSY

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rocket motor facilities has such a large number of cranes. Three rocket motor test cells are located in a valley. Test cell 1 (item 27, Figure 3) fires north toward the southern side of the earthen barricade that isolates the probable waste propellant disposal area. A smaller blast deflector serves test cells 2 and 3 (items 32 and 33).

Key Areas

Probable Double-Base Propellant Area

8. Buildings apparently associated with propellant mixing and casting in the probable double-base propellant area and in the probable composite propellant area were among the first to be constructed at the Lyubertsy solid motor production plant.

9. The probable double-base propellant area consists of five processing buildings. Ingredients storage and/or preparation functions for double-base casting probably are handled in a building (item 47), which is connected by a covered walkway to the probable casting powder preparation building (item 53). This building is linked by another covered walkway to a heavily barricaded casting building (item 55). Immediately to the west of the casting building barricade is a mound through which the cast motors are hauled after leaving the main barricade. This configuration, excluding item 47, is similar to the arrangement of the probable double-base casting powder preparation building and one of the probable casting buildings at Kamensk-Shakhtinskiy Chemical Combine 101.¹ Both buildings were present in mid-1962, but it is possible that the double-base casting arrangement at the Lyubertsy plant may predate the one at Kamensk-Shakhtinskiy.

10. After emerging from the casting building, the motors probably are moved to the finishing building (item 52) where mold disassembly and mandrel removal processes may be accomplished. This building is also similar to a building at Kamensk-Shakhtinskiy Chemical Combine 101 which was identified as a probable mold disassembly and mandrel removal building. Machining and other finishing processes probably take place in the finishing building, item 50.

Probable Composite Propellant Area

11. This area has been identified as the probable composite propellant area because of the appearance of the processing buildings in the area five of which are heavily barricaded, and because test cell 1 in the test area is nearly identical to a section of the large test cell at Kemerovo Solid Propellant Rocket Motor Test Facility.² It also is similar to the large test cell at the Krasnoarmeysk Solid Motor Development Facility.³ Both the Kemerovo and Krasnoarmeysk facilities are believed to be composite propellant rocket motor producers.

12. The probable composite propellant area appears to have two separate mixing and casting lines. One line consists of a probable ingredients preparation and mix building (item 10) and a probable casting building (item 11). The second consists of a probable ingredients preparation and mix building (item 8) and a probable casting building (item 7). Item 9 may serve as a magazine for intermediate storage of partially processed composite propellant rocket motors, or the building could be used for the curing of small rocket motors. Three curing buildings at the composite propellant rocket motor production area in Kamensk-Shakhtinskiy are similar in size and configuration to the possible magazine/curing building at Lyubertsy.⁴

13. The probable temperature conditioning and motor finishing building (item 14) was the latest major building constructed in the probable composite propellant area. The southern end of the building is divided into three equal-sized bays, which probably function as the temperature conditioning section. Three pipes on the roof of the building connect the low bay on the eastern side with each of three bays.

14. If the large number and the size of gantry cranes in the facility are necessary because of the weight of the rocket motors being handled, and the weight is attributed in part to the use of heavy reuseable casings, it might then be advantageous to have a case preparation building near the test cells for easy transfer of the heavy rocket motor cases after test firing for cleaning and preparation for reuse. A possible case preparation building (item 35) was constructed during the same time period that the double-base and composite mixing and casting buildings were built; it is served by a large gantry crane and appears

physically capable of handling case preparation functions. Two storage/support buildings (items 36 and 37) may support this preparation building.

Possible Nondestruct Test Area

15. An area on the western side of the facility is designated the possible nondestruct test area where ultrasonic or radiographic motor inspection could take place. The area consists of four major buildings, three of which are heavily and individually barricaded and serviced by one large gantry crane (items 2, 3, and 4). Each building is connected by pipe or cable to a protected control house within the western barricade. The fourth building (item 1) is a drive-through, A-frame structure.

Probable Waste Propellant Disposal Area

16. The area identified as a probable waste propellant disposal area is the best candidate for that function in the facility. The area is bounded on three sides by high natural barricades with a building at the open side. Other Soviet waste propellant disposal areas are remote and are barricaded so that no hazard to nearby structures is likely. A control building usually is present.

Test Area

17. The principal facilities in the test area are the three test cells, Figure 3. Test cell 1 is the largest and is similar to the larger part of the dual position test cell at the Kemerovo Solid Propellant Rocket Motor Test Facility and to the large test cell at the Krasnoarmeysk Solid Motor Development Facility.

18. Test cell 2 has similarities to the four test cells at Leningrad Solid Propellant Rocket Motor Test Facility 1.⁵ In particular, the flared configuration of the firing end of test cell 2 at Lyubertsy resembles the construction of the firing end of the four Leningrad test cells.

19. There are no other known Soviet test cells like test cell 3. It is, however, somewhat similar to the test position at the horizontal test site at Pei-ching Guided Missile Development and Production Center, Chang-hsin-tien, China.⁶

Chronology

20. It is possible that a solid propellant research and development program may have begun at the nearby Moscow Explosives and Propellant R&D Facility, Lyubertsy (Figure 1) with small-scale bench testing of solid propellant formulations. The program could then have progressed to the construction of experimental solid propellant casting plants and test facilities at the Moscow Solid Motor Production Plant, Lyubertsy, where larger research and development experiments could be carried out. Examination of [] 25X1 [] established the fact that no structures were then present in the area now occupied by the Moscow Solid Motor Production Plant, Lyubertsy.

Present in []

21. The first interpretable [] coverage of the facility on [] 25X1 photography indicated that most of the structures in the probable double-base and composite propellant areas were present, as well as several support structures. Double-base propellant production structures present in 1962 included the probable casting powder preparation building (item 53), the casting building (item 55), the finishing building (item 52), and a support building (item 51). Elements of the probable composite propellant area included both probable ingredients preparation and mix buildings (items 8 and 10) and both probable casting buildings (item 7 and 11), the possible magazine/curing building (item 9), and a warehouse (item 5). In addition, the possible rocket motor case preparation building (item 35) was present in 1962.

22. The probable waste propellant disposal area (Figure 3) was present at the northern end of the facility. The area consists of a probable burning pit isolated from the remainder of the facility on three sides by a high barricade. Support elements present in 1962 included 25X1

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FIGURE 2. MOSKA SOLID MOTOR PRODUCTION PLANT, LIBERTY

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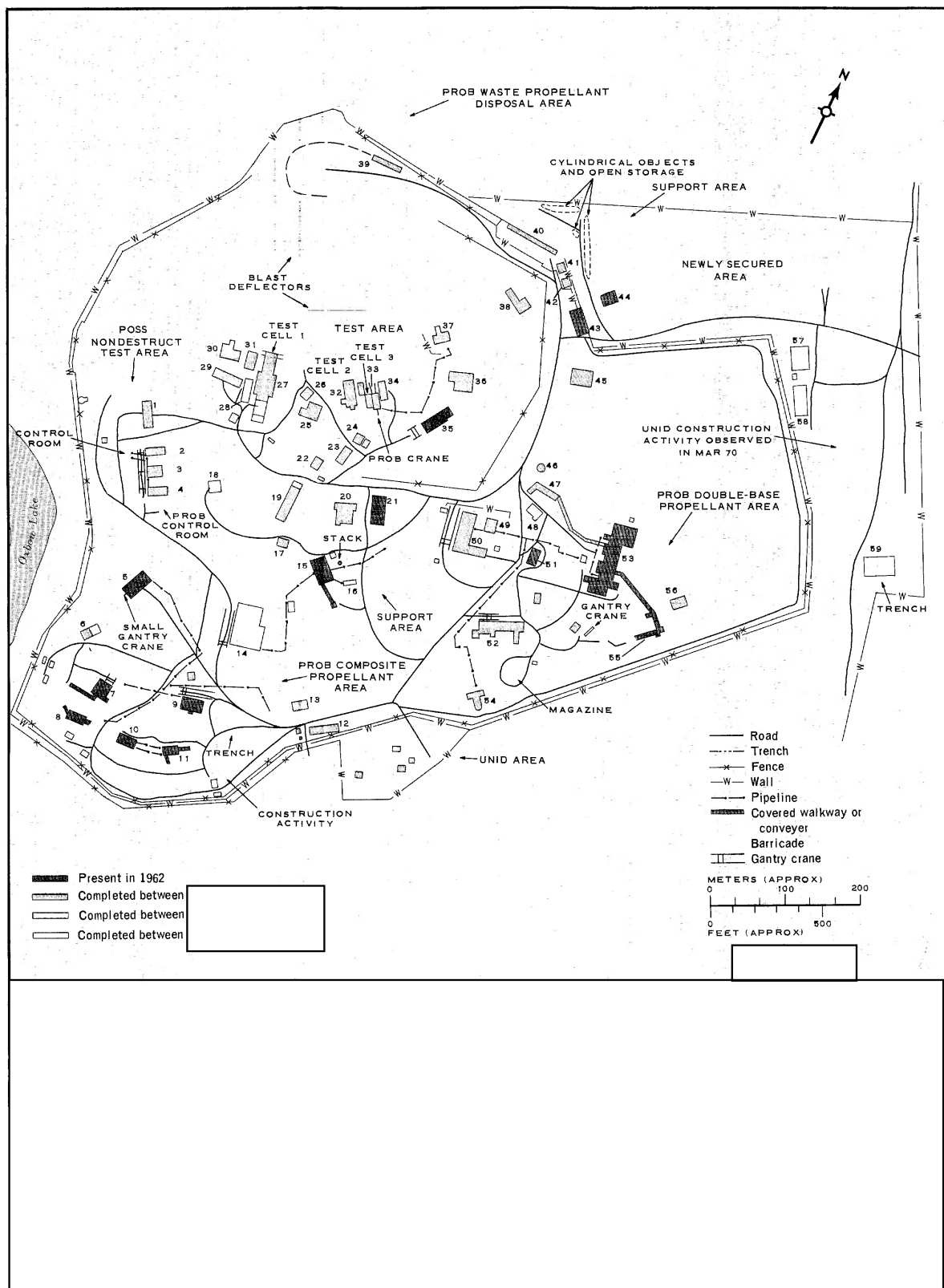
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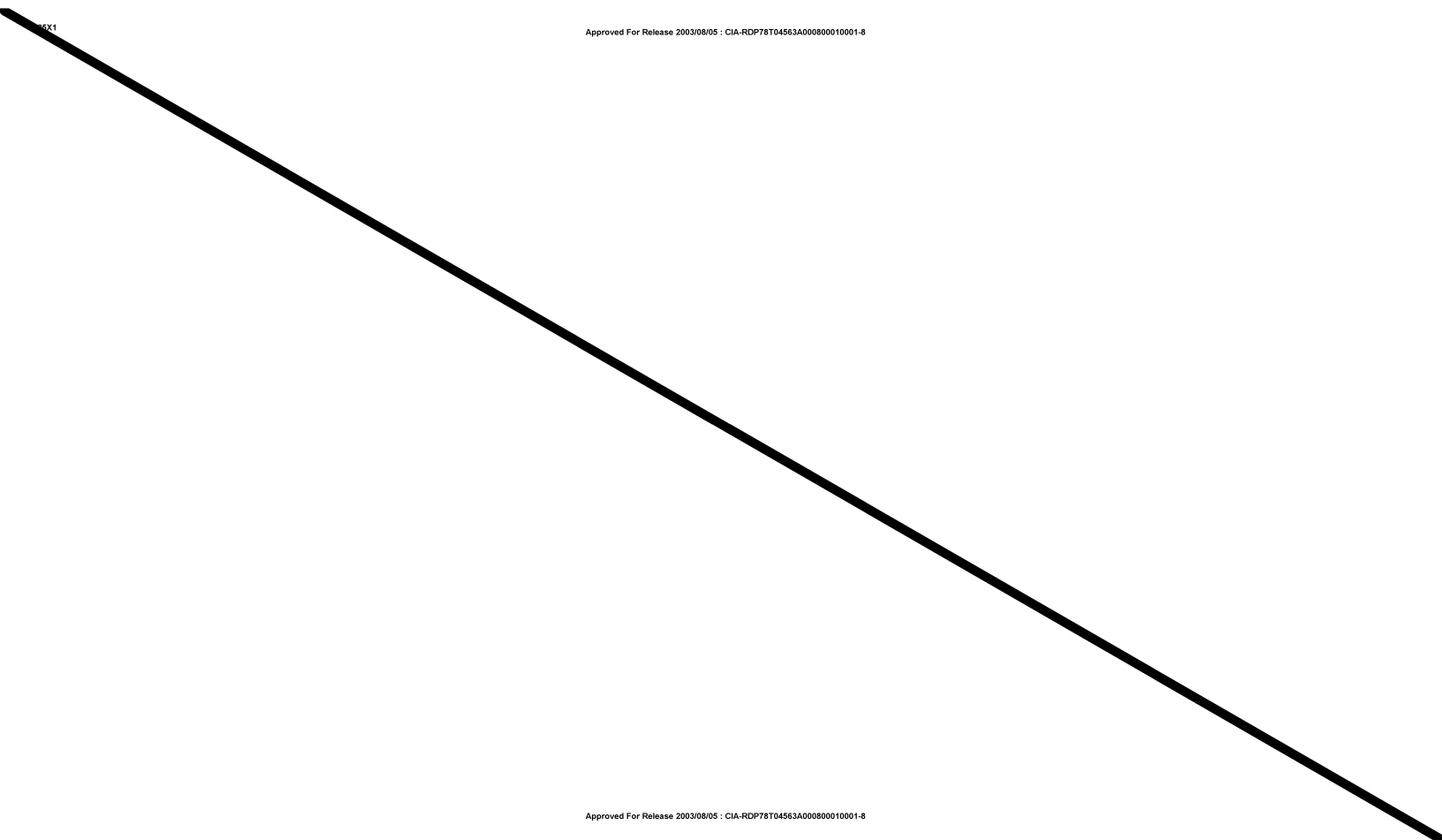
FIGURE 3. LAYOUT OF MOSKVA SOLID MOTOR PRODUCTION PLANT LYUBERTSY

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the steamplant (item 15), administration or administration/engineering buildings (items 21 and 43), and a warehouse (item 44).

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23. Most structures in the facility appeared complete and were probably operational by [redacted] or earlier. Significant structures observed complete on [redacted] photography included the probable ingredients storage/preparation building (item 47) and the finishing building (item 50) in the probable double-base propellant area, the four principal buildings in the possible nondestruct test area (items 1-4), and the three test cells (items 27, 31, and 32).

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24. The most important structure built during this period was the probable temperature conditioning and motor finishing building (item 14). The only other structures completed during this period were support buildings, primarily in the vicinity of test cell 1. Other significant construction started during this period occurred on the east side of the facility, where the secured area was expanded. Expansion activity was first observed on [redacted] photography. By [redacted] the security wall delineating the new area had been nearly completed, and early construction activity at two points was observed (Figure 3).

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25. The primary construction at the facility during this period was the completion of two buildings (Figure 3, items 57 and 58) in the newly secured area on the eastern side of the facility. Other construction in the area consisted of a building in the early stage of construction and an unidentified area of construction. A building was also under construction in the probable composite propellant area. The support area on the northern side of the facility has been expanded to include an open storage area.

Production Activity

26. The only evidence of production to date consists of 28 cylindrical objects, possibly canisters, approximately [redacted], that were located in the newly secured part of the support area in the northern part of the plant on [redacted]

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Essential Services

27. The support area in the center of the facility consists of four buildings: a steamplant (item 15), a probable storage building (item 19), a probable engineering building (item 20), and an administrative/engineering building (item 21). The probable source of power is the Moscow Heat and Power Plant, Lyubertsy TETS 22, 1.8 nm west of the facility.

28. The facility is not served by rail, but there is an apparently heavy-duty road network. Materials apparently are received and some of them probably stored in the support area surrounding the gate entrance. A warehouse (item 44) is located outside of the old security wall and fence. The long, separately secured storage building (item 40) may be used for storing flammable ingredients.

29. The probable storage building (item 19) has a gantry crane at its northern end and could be used for storage of rocket motors prior to testing. Items 20 and 21 appear to be used for research and engineering functions, and items 23 and 43 appear to serve an administrative function.

30. A previously unidentified building (item 45) may be a laboratory building. A building similar in size and configuration is located at the probable composite modified double-base plants at Biysk Solid Propellant Rocket Motor Test and Propellant Production Facilities⁷ and at Perm Munitions and Chemical Combine K. Kirov 98.⁸

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REFERENCES

IMAGERY

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MAPS OR CHARTS

ACIC. USATC, Series 200, Sheet M0167-5HL, 3d ed, Jul 67, scale 1:200,000 (SECRET [REDACTED])

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DOCUMENTS

1. NPIC. [REDACTED] *Kamensk-Shakhtinskiy Chemical Combine 101*, Dec 68 (TOP SECRET [REDACTED])
2. NPIC. [REDACTED] *Chronological Development of the Solid Propellant Rocket Motor Production and Test Facilities, Kemerovo, USSR*, Jun 67 (TOP SECRET [REDACTED] CODEWORD [REDACTED])
3. NPIC. [REDACTED] *Krasnoarmeysk Solid Motor Development Facility, USSR*, Jan 70 (TOP SECRET [REDACTED])
4. NPIC. [REDACTED] *Advanced Solid Propellant Production Area Chemical Combine No. 101 Kamensk-Shakhtinskiy, USSR*, Dec 66 (TOP SECRET [REDACTED] CODEWORD [REDACTED])
5. NPIC. [REDACTED] *Leningrad Solid Motor Test Facilities 1, 2, and 3, USSR*, Aug 69 (TOP SECRET [REDACTED])
6. NPIC. [REDACTED] *Pei-ching Guided Missile Development and Production Center, Chang-hsin-Tien, China*, Oct 66 (TOP SECRET [REDACTED] CODEWORD [REDACTED])
7. NPIC. [REDACTED] *Chronological Development of Solid Propellant Rocket Motor Test and Propellant Production Facilities, Byisk, USSR*, Dec 66 (TOP SECRET [REDACTED])
8. NPIC. [REDACTED] *Chronological Development of Selected Solid Propellant Facilities at the Munitions and Chemical Combine K. Kirov No. 98 Perm, USSR*, Feb 67 (TOP SECRET [REDACTED])

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REQUIREMENT

COMIREX BR-J04
NPIC Project 221314

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